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TASKS OF THE USSR PETROLEUM INDUSTRY IN THE FIFTH FIVE-YEAR PLAN (1951 - 1955)

Prof S. R. Sergiyenko

In connection with the directives of the 19th Congress of the Communist Party in regard to petroleum production during the Fifth Five-Year Plan, it may be noted that the Academy of Sciences USSR has accumulated in recent years a considerable amount of valuable experience in prospecting for petroleum and gas. Nevertheless, practical experience of geological expeditions shows that much remains to be done in order that the tasks set by the directives may be completed to the fullest extent.

In accordance with the directives mentioned above, the current Five-Year Plan provides an exceptionally high rate of expansion for the petroleum industry. While the production of the machine building and metalworking industries is to be doubled, the production of petroleum industry equipment is to be increased 3.5 times and that of control and regulation instruments (automatic and telemechanic appliances) 2.7 times. The last-mentioned figure gives an idea of the high degree of automatization, particularly in the petroleum and chemical industries, which will be achieved at the end of the Five-Year Plan.

During the prewar five-year plans, the USSR petroleum industry expanded at a rapid rate. On 9 February 1946, Stalin stated that the 1940 production of crude petroleum in the USSR amounted to 31 million tons, thus exceeding the 1913 Russian production 3.5 times. He indicated the desirability of increasing the crude petroleum output to the level of 60 million tons a year, saying that 15 years or longer would be required to achieve the increases which he mentioned for various branches of industry (steel, coal, and petroleum). In a report made by the Central Committee of the Communist Party to the 19th Party Congress, G. M. Malenkov stated that the increase in crude petroleum production during the 3-year period 1949 - 1951 amounted to 13 million tons, as compared with a prewar rate of increase of 13 million tons in 10 years. According to Malenkov, the production of crude petroleum in 1952 will total 47 million tons.

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The Fourth Five-Year Plan of the petroleum industry (1946 - 1950) was fulfilled in 4 years and 3 months. As outlined in the directives of the Party Congress, the Fifth Five-Year Plan provides for an 85-percent increase in crude petroleum production, which is a much higher rate of increase than that set for other industries. Still higher rates are set for increases of production capacity in the petroleum conversion industry. The number of petroleum conversion plants will be increased considerably. Furthermore, petroleum specialists have been given the task of improving the qualitative indexes of plant operation, i.e., they will have to extend the range of products that are manufactured, improve their quality, and, most important, improve the efficiency and completeness of the conversion of crude petroleum.

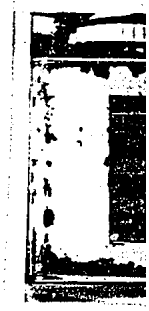
The Fifth Five-Year Plan aims at increased use of air, automotive, and river, as well as sea-going, facilities in the transportation of passengers and cargoes. The power capacity of tractors at MTS will be increased by 50 percent toward the end of this Five-Year Plan. It is apparent from what has been said above that the number of motors and engines operating on petroleum fuels, particularly on distilled petroleum products, will become much greater under the current Five-Year Plan. This explains the planned intensification of petroleum conversion, which will be combined with an improvement in yields of light-colored petroleum products. Especially to be noted is the great increase of the relative proportion of diesel fuel in the total planned output of motor fuels. The main consumers of diesel fuel will be tractors, heavy motor trucks, and ship engines; a considerable increase in the number of these is provided by the directives of the 19th Party Congress. The requirements for automobile and aviation gasolines will also rise: the freight turnover will be doubled as far as air transportation is concerned, and the participation of automotive transportation (automobiles and motor busses) in general transport will increase to a great extent.

The directives of the 19th Party Congress outline a broad program for the technical development of all branches of the petroleum and gas industry during the period 1951 - 1955. This program states that further development of procedures for obtaining crude petroleum from tideland deposits must be provided; recommends that petroleum conversion plants be located nearer to the areas in which petroleum products are used; states that plant capacity for primary treatment of crude petroleum should be doubled during 1951 - 1955, and the plant capacity for cracking crude material increased 2.7 times in such a manner that considerable intensification in the conversion of crude petroleum is achieved, together with improvement in the yields of light-colored products both at plants which are in operation at present and new plants which are yet to be started. In addition, the program includes statements to the effect that production of synthetic liquid fuel should be developed and that construction of main pipelines and storage facilities for crude petroleum and petroleum products should be expanded considerably.

The following specific directive was also issued at the congress: "Further development of the gas industry is to be assured. During the 5-year period, the output of natural gas and petroleum gas, as well as the production of gas from coal and oil shales, should be increased by approximately 80 percent. The use of gas for household needs, as an automobile fuel, and as a crude material for chemical production is to be expanded."

Such are the perspectives for the development of the petroleum industry in accordance with the directives given by the 19th Party Congress. The high rate of expansion which has been set will permit Stalin's directive in regard to an output of 60 million tons of crude petroleum per year to be carried out within the scope of the Fifth Five-Year Plan.

The scientists and production men of the petroleum industry have been given a program which will determine the nature of their activities during the next few years. The party has set before them the task of achieving a considerable



increase in the degree of petroleum conversion and of improving the yield of light-colored products at all petroleum conversion plants. From the economic standpoint, a successful accomplishment of this task is equivalent to an additional production of several million tons of crude petroleum.

Essentially the problem involved here amounts to a more efficient conversion of crude petroleum with complete utilization of all products obtained from it. Improvement in the yields of light-colored petroleum products can be achieved by separating more perfectly the high-molecular hydrocarbon fraction from the resinous products. A further improvement in these yields can be obtained by the treatment or conversion (pererabotka) of high-molecular resinous petroleum products. At present, work is being done in both directions.

The directives of the 19th Party Congress define the basic methods to be used in increasing the production of motor fuels; they stipulate expansion of cracking plant capacity and more thorough and complete isolation of products obtained by distillation at primary conversion plants. Other effective sources for the expansion of motor fuel production will be made available by developing the production of synthetic liquid fuels derived from hydrogenation of coal and heavy petroleum residues, as well as those produced by synthesis using carbon monoxide and hydrogen as crude materials. The carbon monoxide and hydrogen are to be obtained by two methods: (1) gasification of low-grade coal and oil shale; (2) conversion of natural gas.

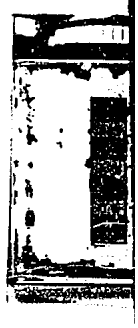
The USSR gas industry is to be expanded to approximately the same extent as the petroleum industry. The 80-percent increase in gas production mentioned in the directives of the 19th Party Congress is to be achieved by using all sources of natural and industrial gas. In other words, it involves increased exploitation of natural gas, more efficient utilization of petroleum gases from oil fields, and production of gas by the gasification of low-calorie solid fuels such as oil shales and some grades of coal.

In connection with the planned expansion of gas production, the following measure seems to be expedient. A full degree of hermetically closed gas casing at gas and oil fields must be achieved so as to reduce losses of gaseous hydrocarbons. This measure will serve the additional purpose of maintaining at a high level the productivity of gas and oil fields.

An important technological measure to be carried out at both gas and oil fields will be complete removal of gasoline from the gas. This measure alone, if it is universally applied, will permit a sizable additional production of gasoline in the USSR.

It should be emphasized that application of the two measures mentioned above is particularly important in the initial stage of the exploitation of a gas occurrence and quite especially so in the early exploitation of an oil occurrence. We know from experience that during the first period of the exploitation of an oil well, the gas from which gasoline has not been removed is allowed to escape into the air or is burned in a gas torch. Only a small quantity of the gas is then used as fuel at the oil field itself. The losses of gas which result from this practice may reach 90-95-percent at some oil fields and wells.

When an oil well is prepared for exploitation, adequate measures to collect, store, and transport the oil are taken immediately. Analogous measures in regard to gas are considered to be of secondary importance and are therefore delayed. As a result of this situation, oil wells almost completely lack equipment for the utilization of gas when their exploitation is started. Hermetic gas casing, equipment for recovery of gasoline from gas, and storage and transportation facilities for gas have not been installed, so that a very large quantity of



gas containing casing head gasoline is irretrievably lost. The gas pressure is particularly high during the early period of the exploitation of the well and drops rapidly in the oil bed or stratum when the gas is wasted in this manner. A more rational exploitation of the well during the initial period would prolong the time during which the gusher functions at the expense of energy contained in the stratum.

The more extensive application of gas for household uses and as an automobile fuel, as outlined in the directives of the 19th Party Congress, will necessitate the installation of a large amount of storage and compressor equipment at gas plants and gas fields as well as along pipelines.

The tasks of greatest importance to chemists are those dealing with fulfillment of assignments given by the party in connection with the manufacture of chemical products from gas. USSR scientists have devised many reactions which permit the production of a large number of valuable chemical substances from natural and industrial gases. Many chemical products of economic importance can be produced from hydrocarbon gases: these products include synthetic elastomers, alcohols, acetylene, halogenated compounds, synthetic gasoline, pharmaceutical products, and a multitude of other chemical products. By combining the experience of the chemical and petroleum industries, the petroleum-chemical industry, which was founded during the prewar five-year plans, will be widely expanded under the current Five-Year Plan.

Particularly favorable conditions for the conversion of hydrocarbon gases into chemical products exist in areas where large hydroelectric power stations are being constructed. This applies especially to the sites of power stations on the Volga and Dnepr. Availability of cheap electric power in these areas will expedite the development of this type of chemical production, which requires large quantities of electric power. One of the directives of the 19th Party Congress stipulates location of petroleum conversion plants nearer to areas where the petroleum products are used. The same directive also applies to the location of plants engaged in petrochemical synthesis. By taking into consideration all aspects of regional economy and the possibilities of combining chemical conversion of hydrocarbon gases with other branches of manufacture, the most advantageous locations for petrochemical enterprises will be found.

In view of the fact that extensive work of great economic importance must be accomplished by petroleum scientists under the terms of the directives pertaining to the current Five-Year Plan, an increase in the number of scientists who are active in this field will be necessary. The directives of the 19th Party Congress provide that the number of scientifically trained personnel specializing in this field and being prepared through graduate study (aspirantura) at higher educational institutions and scientific research institutes be doubled during 1951 - 1955. At the same time, the work of the institutions in question is to be improved by utilizing the available scientific resources to the fullest extent and by assuring the widest practical application of scientific discoveries. Scientists should receive aid in solving theoretical problems, while the cooperation between science and industry ought to be reinforced.

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